

NEW TREE SPECIES FROM ESMERALDAS, ECUADOR
(CONTINUED)

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Five new tree species from the Province of Esmeraldas in northwestern Ecuador are published here in the following genera (and families): Osteophloem Warb. (Myristicaceae), Trattinnickia Willd. (Burseraceae), Tapura Aubl. (Dichapetalaceae), Amanoa Aubl. (Euphorbiaceae), and Sterculia L. (Sterculiaceae). The records of the first 4 apparently are also the first of their genera from Ecuador.

This article is a continuation of one with the same title (Phytologia 18: 195-208, illus. 1969), the second in a series. Each description is accompanied by a line drawing prepared for a book on the common trees of Esmeraldas, now in press. The work was done under the forestry project, Desarrollo Forestal de Noroccidente (DEFORNO). This was United Nations Special Fund Project No. 127, administered by the Food and Agriculture Organization (FAO) of the United Nations and the Government of Ecuador.

A note on the generic name Sickingia should follow the publication of S. standleyi Little (Phytologia 18: 204, fig. 5. 1969). H. K. Airy Shaw (in J. C. Willis, Dict. Flowering Plants Ferns ed. 7, 1037, 1040. 1966) has cited Sickingia Willd. (Ges. Naturf. Fr. Neue Schr. 3: 445. 1801) as a synonym of the older name Simira Aubl. (Hist. Pl. Guiane Franç. 1: 170, t. 65. 1775). The name Sickingia Willd. is in almost universal use for a tropical American genus of Rubiaceae with about 35 species. If found to lose priority to an obscure older name, then Sickingia Willd. should be added to the nomina generica conservanda. In the meantime, existing usage should be followed (ICBN, Rec. 15A).

OSTEOPHLOEM SULCATUM Little, sp. nov. "Chalviande (frutos surcados)," "chalviande colorado," "chalviande." Fig. 6.

Arbor magna sempervirens ad 30-44 m. alta, trunco 0.5-1.5 m. diametro, anteridibus rotundis vel angulatis. Cortex brunneus vel griseus, squamosus, subtiliter fissuratus; cortex interior fulvescens succo aquoso, amarus. Ramuli longi graciles, gemma foliorum minorum. Ramuli juvenes, gemmae, folia juvenia, ramuli inflorescentiae, atque flores stellato-pilosi cinnamomei. Folia alterna biserialia, petiolis tenuibus 2-3 cm. longis puberulis, longitudinaliter sulcatis. Laminae anguste oblongae, 15-26 cm. longae, 3.5-7 cm. latae, chartaceae, apice cuspidatae vel acutae, margine parum revolutae, nervis lateralibus 10-14 leviter curvis utroque latere costae sulcatae, supra virides nitidae glabrae, subtus albae minute stellato-pilosae.



Fig. 6. *Osteophloeum sulcatum*
Little, sp. nov. "Chalviande
(frutos surcados)."

Dioecia. Inflorescentiae masculinae paniculae axillares 2-6 cm. longae multiflorae. Flores masculini pedicello 2 mm. longo, bracteola 0.5 mm. longa, 4-5 mm. longi et lati, calyce trilobo fere ad basim, androecio columnae cylindrae c. 2 mm. longae c. 12 antheras congestas lineares ferente. Inflorescentiae femineae non visae. Fructi drupae dehiscentes solitariae super pedicellis 2 cm. longis, subglobosae 2.5 cm. diametro (in vivo), sulco magno circum basim, bivalves. Semen subglobosum in arillo rubro.

Large evergreen tree to 30-44 m. high, with trunk 0.5-1.5 m. in diameter, with rounded or angled buttresses. Bark brown or gray, scaly, finely fissured; inner bark yellow brown with watery sap, bitter. Twigs long slender, with bud of minute leaves. Young twigs, buds, young leaves, branches of inflorescence, and flowers with cinnamon-colored stellate hairs. Leaves alternate in 2 rows, with slender petioles 2-3 cm. long, puberulent, longitudinally grooved. Blades narrowly oblong, 15-26 cm. long, 3.5-7 cm. wide, chartaceous, cuspidate or acute at apex, acute at base, slightly revolute at margin, with 10-14 slightly curved lateral nerves on each side of grooved costa, above shiny green and glabrous, beneath whitish with minute stellate hairs.

Dioecious. Male inflorescences axillary panicles 2-6 cm. long, many flowered. Staminate flowers with pedicel 2 mm. long, bracteole 0.5 mm. long, 4-5 mm. long and broad, cinnamon-colored, with calyx 4 mm. long, 3-lobed nearly to base, androecium of cylindric column about 2 mm. long with about 12 crowded linear anthers. Female inflorescences not seen. Fruits dehiscent drupes solitary on pedicels 2 cm. long, subglobose, 2.5 cm. in diameter (fresh), with large groove around base, 2-valved. Seed subglobose in red aril. Collected with flowers in July and August, with fruits in June.

Sapwood cream-colored, heartwood brown, distinctive. The wood is intermediate in hardness and weight. The common name chalviande colorado refers to the colored heartwood.

ECUADOR, ESMERALDAS: Panadero, San Lorenzo, alt. 40 m., wet forest, Apr. 25, 1966, R. G. Dixon 272 (male flower buds; HOLOTYPE, US; isotype, NY); same locality, Sept. 25, 1965, E. L. Little, Jr., and R. G. Dixon 21150 (US, NY); San Lorenzo, alt. 10 m., April 20, 1943, E. L. Little, Jr. 6295 (US); Río Palabi, alt. 100 m., June 25, 1966, C. O. Janse 287 (fruit; US, NY); Mataje, Río Mataje, secondary forest, Aug. 1, 1966, C. Játiva 334 (1159) (fruit; US, LA, MADw); Tobar Donoso, junction Río San Juan and Río Camumbi, alt. 260 m., July 27, 1966, C. Játiva and C. Epling 1141 (US, LA).

COLOMBIA, DEPTO. DEL VALLE: Costa del Pacífico, Río Naya, Puerto Merizalde, alt. 5-20 m., Feb. 20-23, 1943, J. Cuatrecasas 14022 (US).

The genus Osteophloem Warb. has had a single species, O. platyspermum (Spruce ex A. DC.) Warb., of the Amazonian region of Brazil, Peru, and Colombia to Guyana. The basionym Myristica platysperma Spruce ex A. DC. (in DC., Prodr. 14: 695. 1857) was based on 2 specimens collected by Spruce near Panure on Río Vaupes, Colombia.

Albert C. Smith in his monograph (Brittonia 2: 451-453, illus. 1937) published a longer description based on additional specimens. Later, Smith (Contrib. U. S. Natl. Herbarium 29: 326-327. 1950) cited 6 specimens collected by Cuatrecasas in Depto. del Valle, Colombia, in 1943. When recording the range extension to the Pacific Coast, Smith noted that those specimens had the leaf blades sometimes abruptly cuspidate at apex, with a callose-tipped acumen about 5 mm. long, and larger flowers with perianth 5-7 mm. long. However, he concluded that the differences in flowers were not sufficient for recognizing the Pacific Colombian material nomenclaturally. J. C. Th. Uphof (in Engler & Prantl, Natürlich. Pflanzenfam. Ed. 2, 17a: 205. 1959) treated the genus as monotypic.

In 1943 I collected a specimen in Esmeraldas with the forest survey of the Latin American Forest Resources Project. This specimen with very young flower buds was tentatively referred in the published list to Virola as probably a new species but too poor for description (Little, Caribbean Forester 9: 234. 1948). The common name "chalviande" was applied also to that genus.

Now that additional specimens are available, the trees of the Pacific slope of southwestern Colombia and Esmeraldas, Ecuador, are named here as the second species of the genus. Sterile specimens of Osteophloem sulcatum are readily distinguished by their larger, narrowly oblong cuspidate leaves from O. platyspermum, which has smaller obovate leaves 7-14 cm. long and 3-6.5 cm. wide, either rounded or obtuse at apex, and with fewer lateral veins, mostly 6-9 on each side. The immature male flowers of the Esmeraldas specimens were not as large as those described from Colombia.

The distinctive feature used in the field in Esmeraldas to separate this species from those of Virola and Dialyanthera in the same family is the prominent groove that surrounds the base of the drupe, to which the specific epithet refers. Fig. 6 illustrates at lower right a fresh fruit with the conspicuous groove around the base. However, the groove is not conspicuous in dried fruits. Also, each flower bears at the base a minute scale or bracteole. The sap of the trunk is watery rather than red as in species of Virola.

The original description of Osteophloem platyspermum mentioned the fruits as "sulcati," suggesting that a similar groove might be more evident in living fruits, though not recorded afterwards.

This species is common locally in the wet tropical forests at low altitudes near the coast in Esmeraldas, becoming a large tree. The giant from which Little and Dixon 21150 was collected was 40 m. high and 1.5 m. in trunk diameter above the large buttresses to 2 m. high, too large to fell for a specimen. However, leaves and fruits were collected on the ground.

The family Myristicaceae is well represented in the wet tropical forests of Esmeraldas, both in number of species and in number of large trees. The woods are commercially important. There are 2 or 3 species of Dialyanthera and a few of Virola, 2 of which will be named as new.

TRATTINNICKIA BARBOURII Little, sp. nov. "Anime pulgande."
Fig. 7.

Arbor magna sempervirens ad 45 m. alta, trunco 120 cm. diametro, anteridibus humilibus rotundatis. Cortex laevis, brunneus; cortex interior brunneus odore Glycyrrhizae. Folia alterna, imparipinnata, permagna, 40-50 cm. larga, petiolo crasso 10 cm. longo longitudinaliter sulcato, axe crasso glabro supra carinato. Foliola 5-7-jugata, petiolulis crassis 0.5-1 cm. longis. Laminae oblongae vel lanceolatae, 15-22 cm. longae, 4.5-7 cm. latae, crassae, rigide coriaceae, apice acuminatae, basi inaequales et subcordatae, margine integrae atque parum revolutae, nervis lateralibus multis parallelis fere rectis sub angulo fere 90° abeuntibus, supra nitidae et leviter asperae, subtus pallidae opacae, nervis lateralibus puberulis valde prominentibus et reti prominenti venularum.

Inflorescentia terminalis paniculata 30 cm. longa axibus ramisque crassis et carinatis. Flores non visi. Drupae numerosae, pedicellis crassis angularibus 1 cm. longis, subglobosae, 1 cm. longae, apice mucronatae, nigrae (in sicco), pulpa exili et putamine ovoideo magno.

Large evergreen tree to 45 m. high, with trunk 120 cm. in diameter, with low rounded buttresses. Bark smooth, brown; inner bark brown, with odor of licorice. Leaves alternate, imparipinnate, very large, 40-50 cm. long, with stout petiole 10 cm. long, longitudinally grooved, and stout glabrous axis keeled above. Leaflets 5-7-paired, with stout petiolules 0.5-1 cm. long. Blades oblong or lanceolate, 15-22 cm. long, 4.5-7 cm. wide, thick acuminate at apex, unequal and subcordate at base, with margin entire and slightly revolute, with many parallel nearly straight lateral veins departing at angle almost 90°, above shiny and slightly rough, beneath pale and dull, with puberulent lateral veins very prominent and prominent network of veinlets.

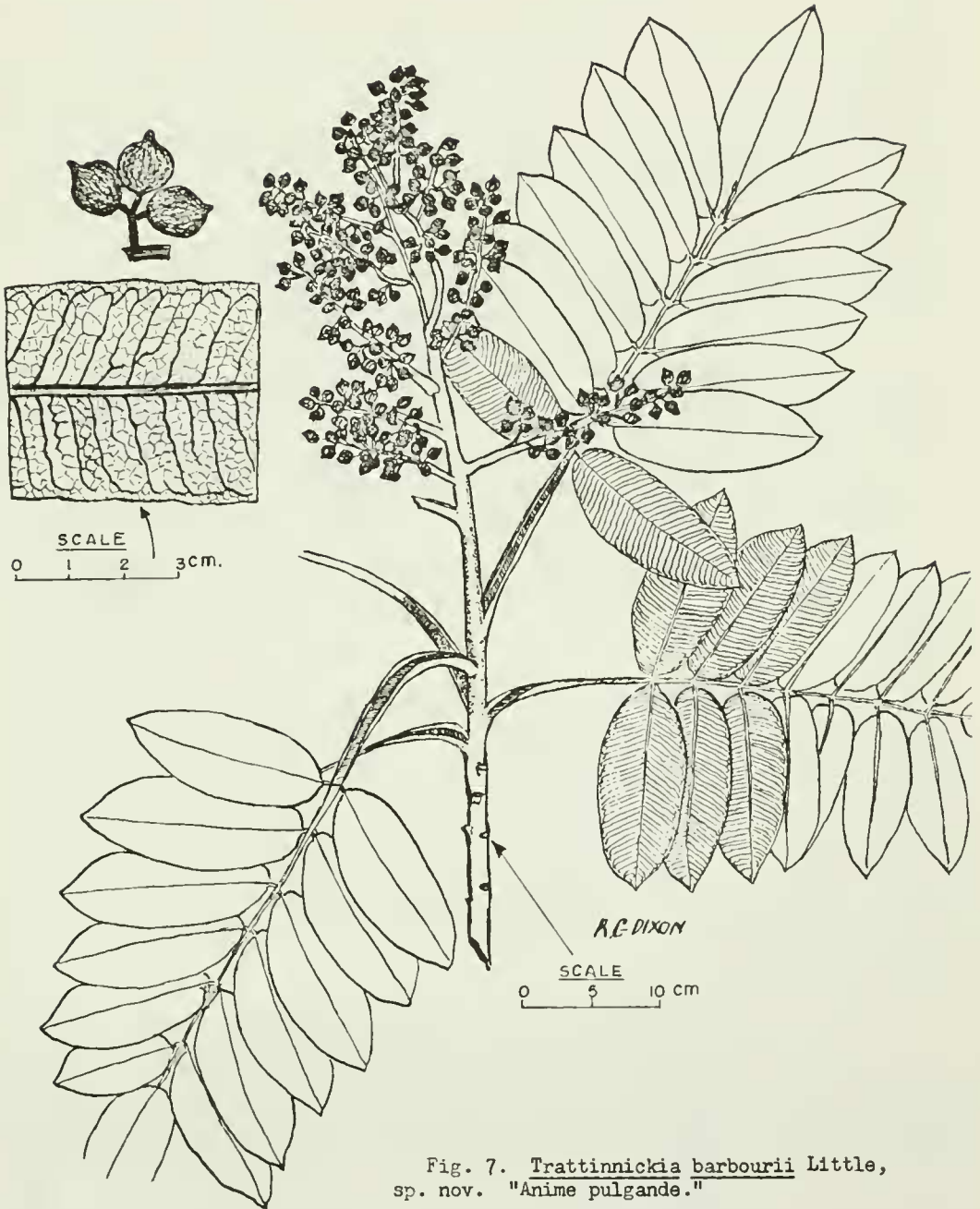


Fig. 7. *Trattinnickia barbourii* Little, sp. nov. "Anime pulgande."

Inflorescence a terminal panicle 30 cm. long, with stout keeled axis and branches. Flowers not seen. Drupes numerous, with stout angular pedicels 1 cm. long, subglobose, 1 cm. long, mucronate at apex, black (dry), with thin pulp and large ovoid stone.

The wood is light brown, light-weight, soft, and coarse-textured.

ECUADOR, ESMERALDAS: Río Palabí, alt. 90 m., wet forest, May 24, 1966, R. G. Dixon 286 (HOLOTYPE, US; isotype, NY; wood sample, MADw).

PANAMA, PROV. PANAMA: Río Indio drainage, 9 mi. E. Trans-Isthman Hy., alt. 800 ft., rain forest, bark with fragrant resin, "caraña," March 23, 1946, W. R. Barbour 1056 (US).

The genus Trattinnickia Willd. (Sp. Pl. 4: 975. 1806; Burseraceae) contains about 12 species of tropical America from Panama to the Guianas, Brazil, and Bolivia but mainly in the Amazon basin. The original spelling adopted here has been restored in a few references, though Trattinnickia is commonly used. J.J. Swart (Rec. Trav. Bot. Néerland. 39: 419-434. 1942) described 9 species in his monograph of the genus. J. F. Macbride (Fl. Peru pt. 3, no. 2: 716-719. 1949) cited 2 species from Peru. José Cuatrecasas (Webbia 12: 420-426. 1957) recorded 5 species from Colombia.

This species is named for the late William R. Barbour, tropical forester of the United States Forest Service and afterwards the Food and Agriculture Organization of the United Nations. Apparently, he made the first collection. It was my good fortune to begin my tropical field work under his guidance in Costa Rica and Panama in February-March 1943. We worked together on the Latin American Forest Resources Project of the U. S. Forest Service. Being inexperienced, I profited greatly from his vast store of information obtained from many years in Puerto Rico and elsewhere in tropical America.

Robert G. Dixon, silviculturist with the United Nations Special Fund Project in Esmeraldas, collected the type specimen and made the accompanying drawing from living material. Barbour's earlier collection from Panama was identified previously as Trattinnickia aspera (Standl.) Swart, a related species with thinner leaflets and fewer lateral veins.

Trattinnickia barbourii has distinctive large leaves with rough stiff thick leaflets, many parallel nearly straight lateral veins, and a prominent network of veinlets on the lower surface. Fig. 7 shows at upper left 3 fruits and a detail of the lower leaflet surface with prominent network of veinlets.



Fig. 8. *Tapura angulata* Little, sp. nov. "Fruto de pavo."

TAPURA ANGULATA Little, sp. nov. "Fruto de pavo." Fig. 8.

Sec. *Dischizolaena* Baill. Arbor parva sempervirens ad 10 m. alta, trunco 12 cm. diametro aliquantum angulato. Cortex atro-brunneus, fere laevis, verrucosus; cortex interior eburneus succo paulo rubello. Ramuli juventute puberuli, demum glabri, tenues, nodis annulati. Stipulae 1-1.5 cm. longae, angustae acuminatae, gemmam angustam et cicatrices annulares formantes, caducae. Folia alterna serialibus 2, juventute puberula, demum glabrata, petiolis brevibus crassis 1 cm. longis longitudinaliter sulcatis. Laminae ellipticae, 14-21 cm. longae, 5.5-7 cm. latae, chartaceae, apice acuminatae, basi acutae, margine parum revolutae, nervis lateralibus utroque latere 8-10 curvis et leviter impressis.

Flores 3-9 prope apicem petioli insertes, ab alabastro globoso 2 mm. diametro pedicellis puberulis 3-5 mm. longis extensi, 6-7 mm. longi, actinomorphi, campanulati, puberuli; calyx 6 mm. longus 5 lobulis rotundatis imbricatis 3-4 mm. longis; corolla 6-7 mm. longa, alba, tubo cylindrico et 5 lobulis ovatis auriculatis obtusis c. 2 mm. longis fere aequalibus; stamina 5 ad apicem tubi corollae alternatim lobulis inserta, fere sessilia antheris 1 mm. longis; et super disco ovarium ellipsoidale vel subglobosum 3 mm. longum, 3-loculare, 2 ovulis in quoque loculo; stylus 3 mm. longus, hirsutus, 3-partitus. Drupae 1-4, ellipsoidales 1.5-2 cm. longae, 1 cm. diametro, fulvae, puberulae, semine 1.

Small evergreen tree to 10 m. high, with trunk 12 cm. in diameter and somewhat angled. Bark dark brown, nearly smooth, warty, inner bark yellowish white with a little reddish sap. Twigs puberulent when young, at length glabrous, slender, ringed at nodes. Stipules 1-1.5 cm. long, narrowly acuminate, forming narrow bud and annular scars, caducous. Leaves alternate in 2 rows, puberulent when young, at length glabrate, with short stout petioles 1 cm. long, longitudinally grooved. Blades elliptic, 14-21 cm. long, 5.5-7 cm. broad, chartaceous, acuminate at apex, acute at base, slightly revolute at margin, with 8-10 lateral nerves on each side curved and slightly impressed.

Flowers 3-9 inserted near apex of petiole, spreading from globose bud 2 mm. in diameter on puberulent pedicels 3-5 mm. long, 6-7 mm. long, actinomorphic, campanulate, puberulent; calyx 6 mm. long with 5 rounded imbricate lobes 3-4 mm. long; corolla 6-7 mm. long, white, with cylindric tube and 5 ovate auriculate obtuse lobes about 2 mm. long, nearly equal; stamens 5, inserted at apex of corolla tube alternate with lobes, nearly sessile with anthers 1 mm. long; and on the disk the ovary, ellipsoidal or subglobose, 3 mm. long, 3-locular, with 2 ovules in each locule; style 3 mm. long, hirsute, 3-parted. Drupes 1-4, ellipsoidal, 1.5-2 cm. long, 1 cm. in diameter, fulvous, puberulent, with 1 seed.

ECUADOR, ESMERALDAS: Camino Pacto NW. of Quito, alt. 1500 m., lower montane forest, Feb. 26, 1965, E. L. Little, Jr., and R. G. Dixon 20451 (HOLOTYPE, US; isotype, NY).

Fig. 8 illustrates a leafy twig with 2 inflorescences inserted near apex of petiole, also at bottom a leaf bearing 2 drupes.

The genus *Tapura* Aubl. (Dichapetalaceae) has about 5 species in the West Indies, 15 in tropical South America mostly in the Amazonian region, and 4 in tropical Africa. Three species have been named from Colombia. This new species apparently is the first record of the family from Ecuador.

Engler and Krause (in Engler & Prantl, *Natürlich. Pflanzenfam.* Ed. 2, 19c: 10. 1931) distinguished 3 sections in the genus *Tapura*. The auriculate corolla lobes and 5 fertile stamens place this new species from Ecuador in Sect. *Dischizolaena* Baill., illustrated by *T. capitulifera* Baill., of Amazonian Brazil and Surinam, with smaller flowers and leaves. The new species, named for its angled trunk, apparently is related to *T. costata* Cuatr. (Lloydia 11: 221. 1948), from El Chocó, Depto. del Valle, Colombia, described from a specimen with immature flowers. It has a grooved, ribbed, twisted trunk and 5 nearly equal anthers but has smaller leaves with fewer lateral veins and flowers in dense heads on very short pedicels.

AMAZOA ANCHALA Little, sp. nov. "Cuero negro," "piedrita."

Fig. 9.

Arbor magna sempervirens ad 30 m. alta, trunco 50 cm. diametro, radicibus fulcrantibus angustis minus quam 1 m. altis. Cortex griseus, fere laevis, valde verrucosus, fissuratus; cortex interior aurantiacus vittis roseis. Ramuli penduli, grisei vel cinnamomei, glabri, lenticellis punctorum similibus et fissuris longitudinalibus. Folia alterna biserialia, glabra, stipulis intra-axillaribus binatis obtusis, squamiformibus, fere 2 mm. longis, petiolis minus quam 1 cm. longis, flavovirentibus, longitudinaliter sulcatis. Laminae ellipticae, 9-15 cm. longae, 3-6.5 cm. latae, plus minusve coriaceae, apice acuminatae, basi rotundae vel acutae, margine integrae, paulo inflexae, nervis lateribus utroque latere 10-13, parum curvis et impressis, supra atrovirentes nitidae, subtus pallido-virides opacae nervis prominentibus.

Dioecia. Inflorescentiae spiciformes terminales et laterales, pendulae, ex 1-3 axibus non ramosis, longis, crassis lignosis angularibus, cinnamomeis, 20-40 cm. longis, 2-3 mm. diametro, floribus multis 5 mm. longis paucis vel pluribus fasciculatis compositae. Flores feminei in pedicellis viridibus 2 mm. longis, sepalis 5 ovatis 5 mm. longis, albidis vel flavescentibus; petalis 5 minutis rotundatis fere 2 mm. longis, albis, fimbriatis; et super disco pistillo 4 mm. longo, ovario conico viridi

3-loculari 3 ovulis et 3 stigmatibus complanatis praedito. Flores masculini fere sessiles, sepalis et petalis eis florum femineorum similaribus, staminibus 5 patentibus, et pistillo rudimentale. Fructi non visi.

Large evergreen tree to 30 m. high and 50 cm. in trunk diameter, with narrow prop roots less than 1 m. high. Bark gray, smoothish, very warty, fissured, inner bark orange, streaked with pink. Twigs pendulous, gray to cinnamon brown, glabrous, with dotlike lenticels and longitudinal fissures. Leaves alternate in 2 rows, glabrous, with intra-axillary paired obtuse scalelike stipules nearly 2 mm. long and with petioles less than 1 cm. long, yellow green, longitudinally grooved. Blades elliptic, 9-15 cm. long, 3-6.5 cm. wide, slightly coriaceous, acuminate at apex, rounded or acute at base, with entire margin, slightly inflexed, with 10-13 lateral nerves on each side, slightly curved and impressed, above shiny dark green, beneath dull light green with prominent nerves.

Dioecious. Inflorescences spikelike, terminal and lateral, drooping, composed of 1-3 unbranched long stout woody angular cinnamon brown axes 20-40 cm. long, 2-3 mm. in diameter, and many flowers 5 mm. long, few to several in fascicles. Female flowers on green pedicels 2 mm. long, composed of 5 ovate sepals 5 mm. long, whitish or light yellow; 5 minute rounded petals nearly 2 mm. long, white, fringed; and on a disk the pistil 4 mm. long with conic green 3-celled ovary with 3 ovules and 3 flattened stigmas. Male flowers almost sessile, with sepals and petals similar to those of female flowers, 5 spreading stamens, and rudimentary pistil. Fruits not seen. Collected with flowers in September.

Wood hard, with pink sapwood cream-colored in outer part and with dark brown heartwood.

ECUADOR, ESMERALDAS: Borbón, alt. 1 m., guandal (fresh-water swamp), Sept. 19, 1965, E. L. Little, Jr., and R. G. Dixon 21095 (female flowers; HOLOTYPE, US; isotype, NY) and 21096 (male flowers; US, NY).

This species seems odd or anomalous in a few characters, being dioecious in a genus characterized as monoecious. The few trees observed together in full flower produced great quantities of flowers uniformly of the same sex. To obtain the female flowers, it was necessary to fell a large tree (21095). The description of the flowers is largely from fresh material. Fig. 9, drawn from a living specimen, shows the pedicellate female flowers. The distinctive terminal inflorescence is pendent or drooping, with stout woody axis much longer than in the other species. It resembles slightly the much shorter and more slender inflorescence of Ananoa oblongifolia Muell. Arg. of Amazonian Brazil, Colombia, and Venezuela.

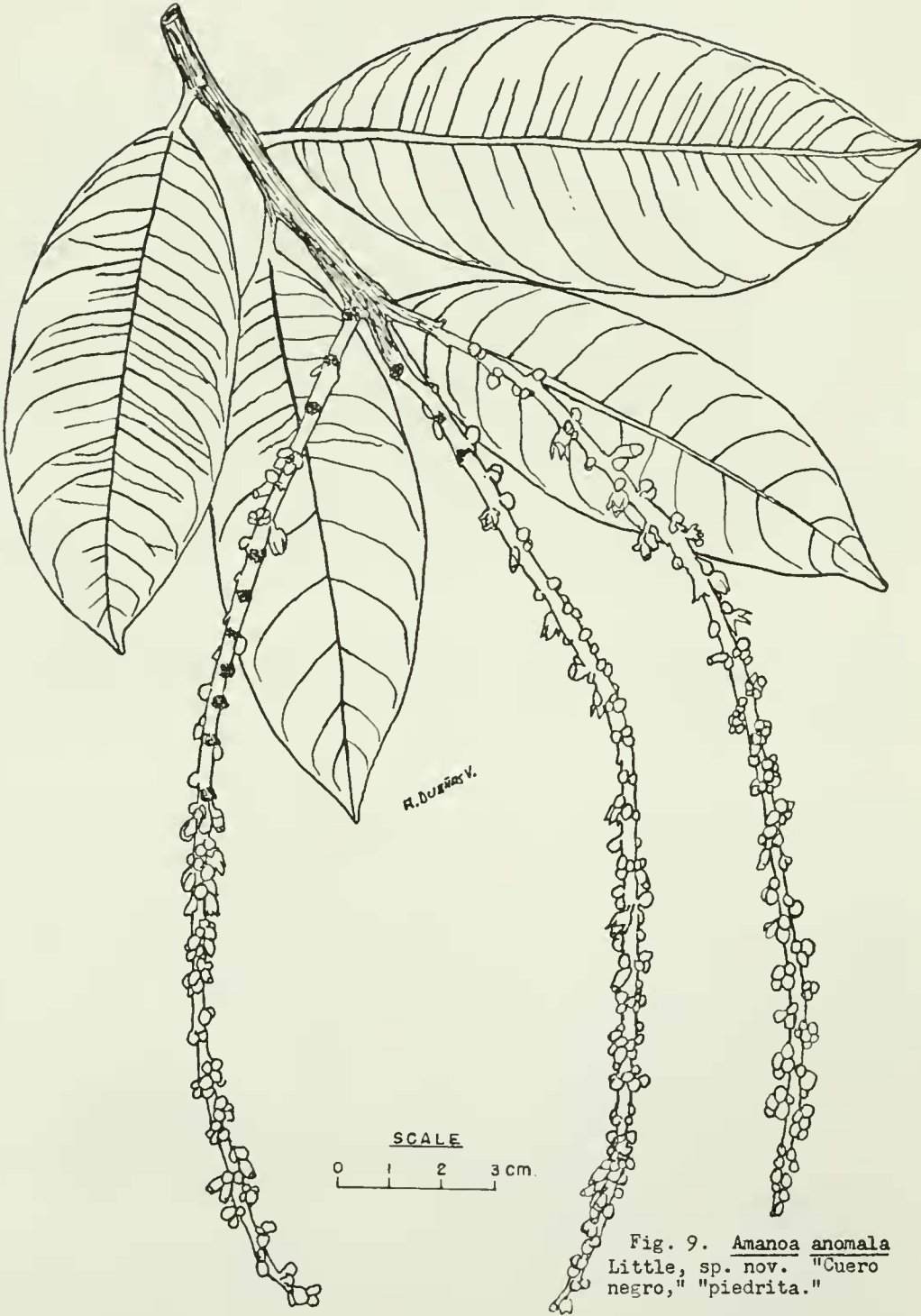


Fig. 9. Amanoa anomala
Little, sp. nov. "Cuero
negro," "piedrita."

The genus *Amanoa* Aubl. (Euphorbiaceae) has about 10 species of trees in tropical America from Brazil and Bolivia north to Venezuela, Colombia, Guatemala, British Honduras, and the Antilles. There are also 3 species in tropical Africa.

STERCULIA CORRUGATA Little, sp. nov. "Paragua." Fig. 10.

Arbor magna sempervirens ad 35 m. alta, trunco 70 cm. diametro. Cortex griseus, asper lenticellis verrucosis et fissuris angustis; cortex interior fulvescens. Ramuli grisei, crassi, plus quam 1 cm. diametro, cicatricibus foliorum rotundis elevatis notati, gemma squamarum angustarum grisearum puberularum. Squamae et stipulae multae, lanceolatae, valde acuminatae, 5-8 cm. longae et 1.5-2.5 cm. latae, extus puberulae, persistentes. Folia alterna, pauca, ad apicem ramulorum aggregata, simplicia, petiolis crassis teretibus 5-9 cm. longis, stellato-pilosis vel glabratiss. Laminae ellipticae, 18-27 cm. longae, 12-18 cm. latae, apice obtusae, basi subcordatae, margine plus minusve undulatae et revolutae, coriaceae, rigidae, maxime corrugatae, e basi 5 nervis principalibus, nervis lateralibus utroque latere 6-9, nervis venulisque reticulatis et valde impressis in sulcis ab porcis ad 5 mm. altis separatis, supra virides nitidae et glabratae, subtus virides pallidae nervis elevatis leviter stellato-pilosis.

Flores non visi. Carpella fructuum veterum irregulariter ovoidea vel pyriformia, 5-8 cm. longa et lata, asymmetrica, apice acuta, rugosa atque puberula, brunnea, pericarpio ad 1 cm. crasso. Semina multa oblonga, 2.2 cm. longa.

Large evergreen tree to 35 m. high, with trunk 70 cm. in diameter. Bark gray, rough, with warty lenticels and narrow fissures; inner bark light brown. Twigs gray, stout, more than 1 cm. in diameter, with round raised leaf scars, with bud of narrow gray puberulent scales. Scales and stipules many, lanceolate, long acuminate, 5-8 cm. long and 1.5-2.5 cm. wide, puberulent on outer surface, persistent. Leaves alternate, few, crowded at apex of twigs, simple, with stout terete petioles 5-9 cm. long, stellate-hairy or glabrate. Blades elliptic, 18-27 cm. long, 12-18 cm. wide, obtuse at apex, subcordate at base, margin slightly wavy and revolute, coriaceous, stiff, very corrugate, with 5 main veins from base, 6-9 lateral veins on each side, the veins and veinlets reticulate and very impressed in furrows separated by ridges to 5 mm. high, the upper surface shiny green and glabrate, the lower surface pale light green with raised veins slightly stellate-hairy.

Flowers not seen. Carpels of old fruits irregularly obovoid or pear-shaped, 5-8 cm. long and broad, asymmetric, acute at apex, wrinkled and puberulent, brown, pericarp to 1 cm. thick. Seeds many oblong, 2.2 cm. long.

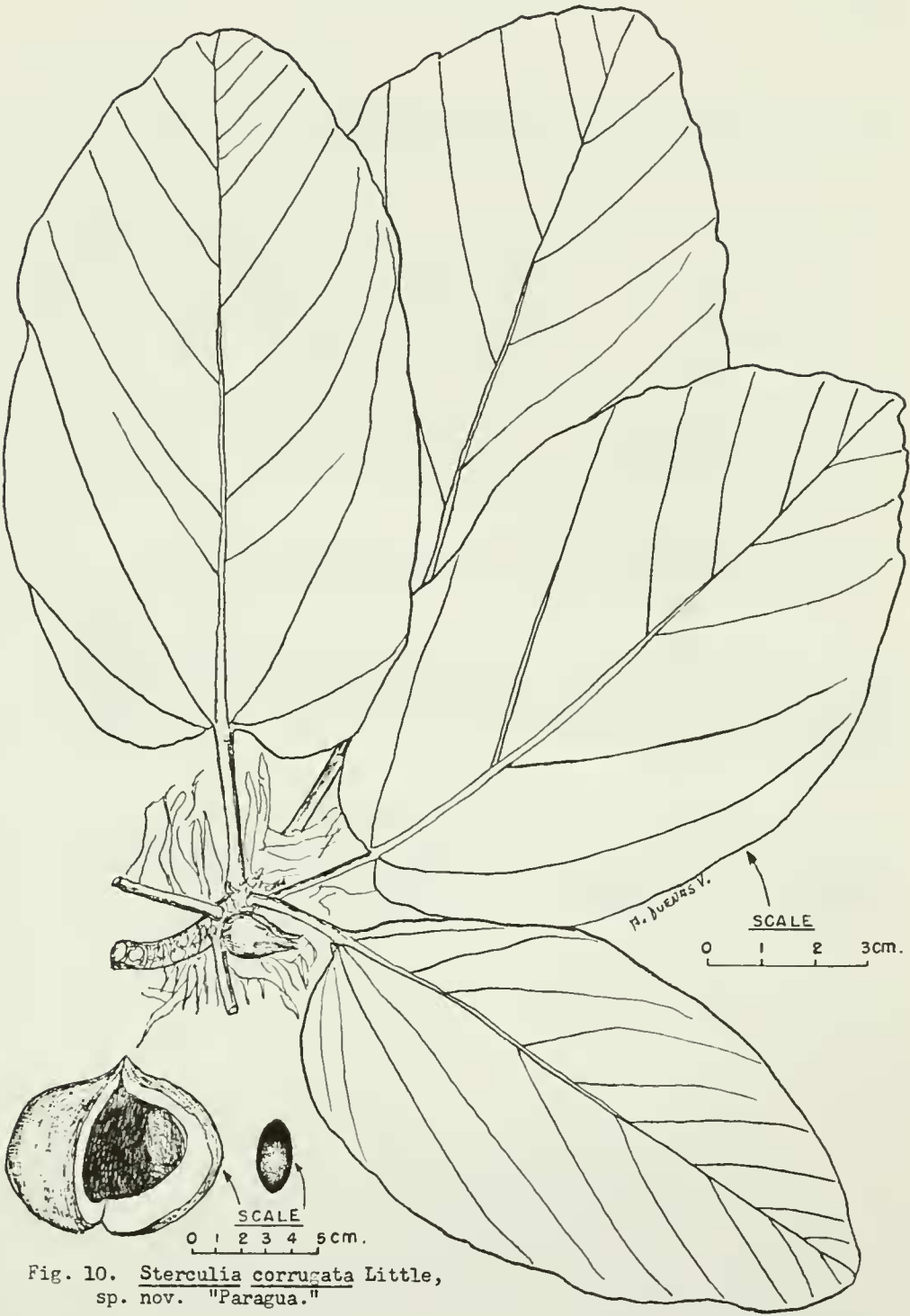


Fig. 10. *Sterculia corrugata* Little,
sp. nov. "Paragua."

Wood with whitish sapwood about 2 cm. thick and whitish brown heartwood, soft, light-weight, coarse-textured, fibrous, with conspicuous large rays. It was reported to be suitable for lumber.

ECUADOR, ESMERALDAS: Borbón, alt. 10 m., wet tropical forest, Sept. 9, 1965, E. L. Little, Jr., and R. G. Dixon 21025 (HOLOTYPE, US; isotype, NY; wood sample, MADw).

This species is readily distinguished by the very corrugate, almost plicate leaves suggesting a relief map with mountain ridges and valleys. It may be related to Sterculia recordiana Standl. of Panama, which has slightly corrugate leaves. Also, the twigs of this new species bear conspicuous large narrow persistent scales 5-8 cm. long, apparently in part stipules.

The tree felled for a wood sample lacked flowers and fruits. However, old fruits containing germinating seeds were collected from the ground beneath. Fig. 10 shows at lower left an opened carpel of an old fruit and a seed.

A second species apparently of this genus is represented in the Esmeraldas collection by an incomplete specimen.

The 5 new tree species from the Province of Esmeraldas, Ecuador, described and illustrated above are: Osteophloem sulcatum (fig. 6), Trattinnickia barbourii (fig. 7), Tapura angulata (fig. 8), Amanoa anomala (fig. 9), and Sterculia corrugata (fig. 10).

(To be continued.)

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